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# FATIGUE MANAGEMENT

A Guide for Canadian Coast Guard  
Managers, Officers and Crew

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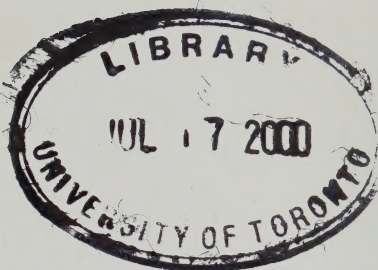
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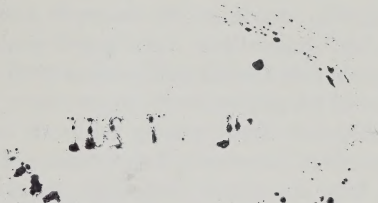
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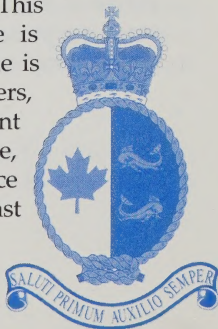
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The Canadian Coast Guard has recognized that the safety and efficiency of its marine operations depends on its ships' officers and ships' crew being alert, well rested, and confident in their skills. Coast Guard also recognizes that in recent years, most operations have been asked to shoulder greater work demands with reduced resources and personnel. In the marine environment, increased workloads and fewer personnel can combine to create conditions where fatigue becomes an important factor, affecting the safety and efficiency of Coast Guard operations. Such increased demands also place a greater burden on the personal, domestic and social lives of personnel and their families. To address these issues, a number of initiatives are underway to examine the impact of fatigue on Coast Guard operations. This Fatigue Management Guide is one such initiative. This guide is intended to provide managers, officers and crew with current knowledge concerning fatigue, as well as strategies to enhance and maintain alertness in Coast Guard personnel.



# Objectives

The Fatigue Management Guide has several essential objectives:

- To raise awareness of the fundamental issues around enhancing alertness and reducing fatigue in Coast Guard shipboard operations.
- To provide current knowledge concerning the fundamental causes of fatigue.
- To examine the important consequences of fatigue and reduced alertness.
- To define the symptoms of fatigue in shipboard settings.
- To provide well-recognized strategies and practical tools for Canadian Coast Guard seagoing personnel to manage fatigue better at a personal and family level.

# Working in the Coast Guard Environment

## Advantages

Every job has good points and bad points. Examining some of these issues may give you a better appreciation of the unique work environment of the Canadian Coast Guard.

- When on board ship, you don't encounter the typical distractions of other shiftworkers (for example, no appointments, children, neighbours or salespeople).
- You have better knowledge about the current status of the priorities in your workplace.
- Your meals are regular and nutritious.
- Some crewing schedules give you relatively long periods of quality time that you can devote to your spouse, family, friends and leisure activities.
- You can take great pride in the accomplishments of your unique service in the Canadian Coast Guard.

## Disadvantages

- Your continuous work can lead to fatigue, which can affect your performance, sleep, health and job satisfaction.
- You have to contend with the marine environment, which often increases fatigue and reduces the quantity and quality of sleep.
- You can be away from home and isolated from family, friends and interests for long periods.
- You have greater responsibility for maintaining coverage at work (for example, someone must be on watch at all times).
- You can spend too much time with your colleagues.



# Becoming Aware of Fatigue & Alertness

Fatigue and alertness may be considered as two ends of the same scale—at one end is complete alertness, at the other end is extreme fatigue.

- When you are alert you think more clearly and act more decisively. This is an ideal state for optimum job performance.
- You can suffer from physical or mental fatigue.
- Physical fatigue results from excessive physical activity, and is characterized by a lack of energy that may or may not be associated with muscular discomfort.
- Mental fatigue impairs your ability to respond quickly and effectively to your environment, and may affect your ability to notice important events and details and make appropriate decisions.
- Mental fatigue may result from inadequate sleep over a short period of time, reduced sleep over a longer time, or working when your body expects to be sleeping.

# Mental Alertness

Mental alertness and the ability to make quick, appropriate decisions are critical in Canadian Coast Guard operations. If you are not mentally alert, you cannot perform at your best. Mental fatigue increases the risk of unsafe actions that may affect you, other crew, or the operation.

Symptoms of mental fatigue that you might see in yourself and your shipmates include:

- Increased drowsiness and irritability.
- Reduced alertness and ability to concentrate.
- Impaired memory and judgement.
- Poorer task performance.
- Increased difficulty with monotonous, repetitive and boring tasks.
- Checking things that have already been done.
- Increased likelihood of “micro-sleeps” (5 to 10 second sleep periods that you may not notice).
- Lowered resistance to the effects of alcohol and drugs and increased risk of illness.

# Causes of Fatigue in CCG Operations

In most Canadian Coast Guard operations, a number of important factors may contribute to fatigue including:

- Working watches
- Overtime or long watches
- Time of day of the watch, with night watches being most fatiguing
- Extreme weather and high sea states
- Intense, attention-demanding work
- Working station-based vessels (i.e., lifeboats)
- Extended periods away from home
- Icebreaking operations
- Search and Rescue operations
- Boredom



# Everyone is Susceptible to Fatigue

The International Maritime Organization (IMO) has recognized that fatigue cannot be prevented by personality, intelligence, education, training, skill, motivation, physical size, strength, or professionalism.

Because everyone is different, you need to understand how susceptible you are to fatigue. Important factors that determine your susceptibility to fatigue include:

- Quantity and quality of sleep
- Circadian rhythms
- Intensity of your work
- Night watches
- Age

The first point is the most important. Never underestimate how much sleep you need.



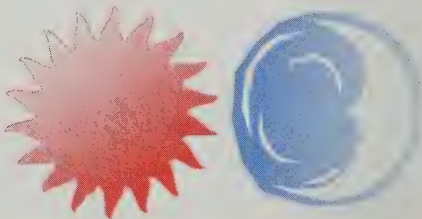
# Quantity and Quality of Sleep

Sleep loss is the most likely cause of fatigue. Obtaining adequate sleep is the best way to improve your alertness. However, the quality of your sleep is also important.

- To function optimally, most people need 7 to 8 hours of sleep per day.
- Sleep is an organized activity divided into stages. It is important to go through all the stages without disruption.
- Reducing the amount of sleep, or disrupting the sleep pattern increases fatigue.
- A long, uninterrupted sleep is better than a short sleep supplemented by a nap.
- Rest is not the same as sleep.
- If you lose sleep regularly, a “sleep debt” will develop, but this sleep debt can be paid back faster than it accumulated. If you lose 2 hours of sleep a day for 21 days, you do not need to pay back 42 hours of sleep; 1 or 2 nights of good, continuous sleep should be enough.
- Sleep cannot be stored or banked.
- The “Fatigue and Sleep Assessment Guide” at the end of this booklet will help you track the amount of daily sleep you obtain, as well as how rested or fatigued you feel.

# Circadian Rhythms

- Circadian rhythms are the daily biological rhythms that your body uses to help you work and sleep.
- Your circadian cycle has a dip that causes low levels of alertness between midnight and 0600h (the time you will be most sleepy) and a smaller dip in alertness in the afternoon between 1200 to 1700h.
- Your job performance is affected by your circadian rhythms. Most people perform best at the peaks of the circadian cycle and worst in the dips.
- In general, morning type personalities are better suited for early morning work and evening types are better suited for evening and night work.



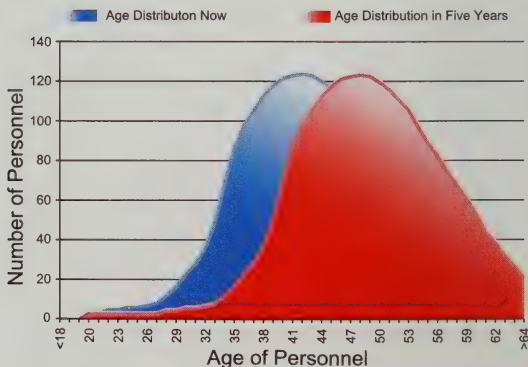
# Intensity of Work

- Moderate levels of workload are the least fatiguing.
- High intensity operations involving physical and mental workload increase fatigue.
- Low workload operations that are routine and monotonous can also be fatiguing.
- Work involving high levels of attention and vigilance will be more fatiguing (for example, watchkeeping, monitoring control rooms or equipment, and SAR).
- High ship motion or icebreaking will increase fatigue, even if your personal workload is low.
- Following high intensity operations, be sure that you obtain adequate sleep to promote recovery.
- Diversity in your daily routine, for example, changes in tasks and environmental conditions, will reduce monotony and maximize alertness.

# The Aging Workforce

Workers begin to report the negative effects of fatigue on performance, sleep and health in their mid- to late-thirties and that these effects become greater with age.

- You may have noticed that as you get older, you tend to become fatigued more easily.
- You may have also experienced more difficulty falling asleep and staying asleep.
- As you get older, you will tend to be more affected by night work and working watches.





- Seagoing Coast Guard personnel are an aging population. The average age now is approximately 44 years old. In 5 years time, the average age will increase to perhaps as high as 48.
- As Coast Guard personnel age as a group, it becomes more important for you to be aware of ways to manage fatigue effectively.

## Standing the Watch

- There is no “best” schedule for watches. Each schedule has advantages and disadvantages.
- Watches that promote sleep at the same time each night will minimize fatigue.
- Working overtime can interfere with sleep patterns and reduce the amount of sleep you obtain. To maximize sleep, overtime should be minimized.

# The Night Watch

- Working at night (between midnight and 0600h) conflicts with your natural circadian rhythms, and is a major contributor to fatigue.
- If you are standing the night watch, the first few days or weeks may be particularly fatiguing while you adjust to your new routine.
- If you are on the night watch, chances are you will sleep less than if you are on the day watch.
- If you change your working and sleeping times (watch schedules) every week or two, you run a greater risk of increased fatigue and poor sleep.
- Permanent night watches may be less fatiguing in activities lasting longer than 2 weeks, since circadian rhythms should slowly change to your new routine.



# Tips for Adjusting Your Circadian Rhythm

It is important to adjust your circadian rhythm before you begin your crewing period and while on board. This will increase your alertness and improve your performance. Following your crewing period, you can use the same tips to adjust your circadian rhythm to your at-home routine.

- On the ship, develop a fixed daily routine that includes sufficient time for sleep.
- If you work a fixed watch schedule, other than the day watch, maintain your daily routine throughout the crewing period.
- Try to obtain as much sleep as possible in one sleep period.
- If you are going to work nights at the outset of a crewing period, try to stay up later and sleep in later in the few days before starting your crewing period.
- Supplement reduced sleep with naps.

# Tips to Help You Sleep

If you are having difficulty falling asleep, try some of these tips for making yourself drowsy. Not all of these tips will work for everyone, but you may find that some of them work for you. Share your personal techniques for falling asleep with your shipmates.

- Try counting or imagining anything repetitive. Repetition is soothing and relaxing.
- Create an ending to a movie or compose a short story. Repeat the same story every night.
- Imagine yourself in the midst of a tranquil scene, perhaps amongst mountains or near a quiet lake.
- Read a boring book—something you can leave at any moment.
- Listen to soothing music or a relaxation tape.
- If you are unable to sleep after 30 minutes of trying one of the previous suggestions, get out of bed and make a list of all your concerns then put them aside to deal with the following day.

# Tips for Napping

Carefully planned naps can help invigorate you for a few hours. However, naps may be counter-productive if they are taken at inappropriate times or they last too long.

- If napping interferes with your ability to get a full night's sleep, then naps should be avoided.
- If you can only nap for a short time, you should try to have "power naps" which last about 20 to 30 minutes.
- If you have more time to nap, a nap of 90 minutes or longer is most refreshing.
- Naps are best if they are taken just before a watch begins, but be sure to allow time after you wake for sleepiness to pass before you report for duty.
- On a 6&6 watch, you do not have the opportunity for at least 7 hours of continuous sleep. Therefore, a daily nap is essential to try to prevent a sleep debt.



# Sleep Etiquette on the Ship

Not only can you improve your own sleep, you can help your shipmates get better sleep by practicing good sleep etiquette. Good sleep etiquette means respecting the sleep of off-watch personnel. However, as you know, Canadian Coast Guard vessels perform most operations during daylight hours. Unfortunately for personnel who sleep during the day, the accommodation area may be noisier.

- In the close quarters on board ships, your sleep can be easily disturbed.
- Be aware of who is asleep at what time and avoid disturbing their sleep.
- Post a sign on your cabin door so that others know what watch you are working.
- Close cabin and other doors quietly.
- Do not talk loudly in alleyways, play loud music in your cabin or the lounge, or watch TV in your cabin or the lounge with the volume too loud if it will disturb the sleep of others.

# Tips for Better Sleep

- Follow the general guidelines for sleep hygiene outlined in the checklist at the end of this booklet.
- Make your sleeping room as dark as possible.
- If you are trying to relax by watching TV in a lounge, make the room dark, this will signal your body that it is time to wind down.
- Noise may not necessarily wake you, but it can alter the depth of sleep. To reduce the effects of outside noise, use earplugs, a fan, or gentle background music.
- Make sure your room temperature is comfortable for sleeping.
- Protect your sleep time as a priority. If you are tired, put off domestic work and social activities until you are better rested.
- Plan for your time away from the ship. Allow yourself time to recover after you return to shore, and prepare yourself before you return to the ship.

# Improving Alertness

If you find yourself feeling tired or sleepy on the job, try some of the following:

- Begin a task or activity that will help to keep you alert.
- Start interesting work, activities that involve interaction with others, and rapidly changing activities to invigorate you.
- Begin a conversation, try to move around, or do some on-the-job exercises.
- When possible, perform critical or new tasks and tasks that require sustained attention and concentration when you are most alert.
- Try to put off activities which are well-learned or less critical to times when you might be less alert.
- Report extreme fatigue to your shipmates or supervisor. You may consider requesting relief from your watch.

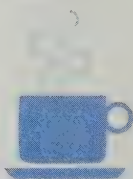


# Maintaining Alertness

- Since inadequate sleep is the primary cause of fatigue, improving your alertness means improving your sleep. The first step is determining when you should sleep in relation to your watch. There are advantages and disadvantages to sleeping immediately after your watch or waiting to sleep and waking-up just before your watch. You must decide which is best for you.
- Vary your job. Change tasks and locations as much as possible. Also, listen to music or the radio, stand up, walk around, and keep the room cool.
- If possible, keep your work area well lit.
- Keep your workplace social—the more interaction the better. Eat in social situations.
- Be aware that some conditions promote sleep, including comfortable furniture, warm air, and a steady low-level background noise.

# Drugs and Alcohol

- Avoid taking drugs that will make you drowsy before work. Even some over-the-counter drugs (for example, some cold medications) will make you drowsy. Consult your doctor or pharmacist to arrange another type of medication or medication schedule.
- Don't self-medicate for insomnia. Use of over-the-counter sleeping medication is not recommended, but medication provided by your doctor may help.
- Use caffeine (such as coffee or chocolate), if necessary, only in the first part of the watch. This means avoiding the use of caffeine 4 to 5 hours before bed. Caffeine too close to the end of your watch may keep you awake when you are trying to sleep.
- If you are having difficulty sleeping, avoid the use of alcohol. Alcohol interferes with sleep quality and duration. The use of alcohol can also cause you to wake up to use the washroom.



# Diet and Exercise

Eating properly and maintaining physical fitness through a program of regular exercise can improve your alertness on the job and help you sleep better.

- Eat regular nutritious meals; try to eat at the same times each day.
- Remember to stay properly hydrated by drinking water or juices, particularly if you are physically active over the course of your watch.
- Eat as soon as you wake up to energize yourself.
- Try to be moderately active for at least 30 minutes each day.
- Use a meal break to exercise in the gym or go for a walk. This can reduce the effect of the “post lunch dip”, that time after lunch when you tend to feel drowsy.
- Exercise when you wake up rather than before you go to bed. This will help your body awaken when you get up and prevent you from being too alert when you are trying to sleep.

# Tips to Help You and Your Family at Home

Communication, sensitivity, time management and compromise are the keys to successful fatigue management with your family. Some of these tips may help you reduce your stress levels, which may in turn improve your sleep at home.

- Educate your family about fatigue. Show them this booklet. Information about fatigue will help your family understand what you are experiencing.
- If they don't already know, explain to your family the type of work you do and the effect that working watches has on you.
- Let your family and friends know that it takes you time to adjust after returning from work, and that this is natural.
- Make it a priority to spend time with your family on your off time. Ask your family to make this time a priority too. Do not leave it to chance.
- Hold family meetings to sort out problems and plan fun events like holidays.

- Take special care of your relationship with your partner. Actively schedule time to be alone together.
- Be flexible and make the most of your time with your children. For example, on your off-duty time, participate in school trips or other activities with your children.
- Be creative in finding solutions to problems. For example, have someone videotape special occasions when you are at work.
- When your children are in school and you are not on board ship, have them come home for lunch or meet them for lunch.



# Epilogue

## EPILOGUE

The Canadian Coast Guard recognizes the excellence of its employees and the importance of their relationships with other crew members and their families. To have quality work and family lives, ships' officers and ships' crew must be in a position to maximize their ability to work well and to enjoy their off-duty time. To accomplish both goals, ships' officers and ships' crew need to become more aware of fatigue and its consequences and work toward minimizing fatigue in all of their operations.

The demands of life as a member of the Canadian Coast Guard will undoubtedly lead to situations where fatigue cannot be avoided and sleep is compromised. A concerted effort to minimize these occurrences will be in the best interests of all those within, related to, or in need of the expertise of the Canadian Coast Guard.

*Together we can make a difference*

# **SLEEP HYGIENE GUIDE**

Sleep hygiene is like dental hygiene. Just as your teeth will decay if you do not take care of them, your sleep will deteriorate if you do not take care of it. The following checklist will help you to identify areas where you can improve the quality and quantity of your sleep.

**CIRCLE THE RESPONSE THAT APPLIES TO YOU**

	<b>Good</b>	<b>Bad</b>
Do you wake at the same time each day?	<b>Yes</b>	<b>No</b>
Do you exercise each day?	<b>Yes</b>	<b>No</b>
Do you set aside time each day to deal with stress? (i.e., to list the next day's tasks)	<b>Yes</b>	<b>No</b>
Do you have time to unwind before bed?	<b>Yes</b>	<b>No</b>
Do you have a regular routine before bed?	<b>Yes</b>	<b>No</b>
Do you go to bed when drowsy?	<b>Yes</b>	<b>No</b>
Have you and your doctor discussed any medical issues that may affect your sleep?	<b>Yes</b>	<b>No</b>
Is your bedroom dark?	<b>Yes</b>	<b>No</b>
Is your bedroom quiet?	<b>Yes</b>	<b>No</b>
Is your bedroom a comfortable temperature?	<b>Yes</b>	<b>No</b>



## CIRCLE THE RESPONSE THAT APPLIES TO YOU

	Good	Bad
Do you exercise close to bedtime?	No	Yes
Do you have a lot of caffeine (i.e., more than 4–5 cups of coffee) during the day?	No	Yes
Do you have any caffeine less than five hours before you go to bed?	No	Yes
Do you have a lot to eat within two hours of going to bed?	No	Yes
Do you consume a lot of fluid within two hours of going to bed?	No	Yes
Do you drink alcohol within two hours of going to bed?	No	Yes
Do you occasionally nap during the day?	No	Yes
Do you take non-prescription drugs?	No	Yes
Is sexual tension preventing you from falling asleep?	No	Yes
Do you engage in any stimulating activity before going to bed (i.e., arguments)	No	Yes



## **FATIGUE AND SLEEP SELF-ASSESSMENT RECORD**

Complete A-E approximately 15 to 20 minutes after waking up. Complete 1 to 3 prior to switching off your light before your major sleep period. Record each score using a scale from 0 to 10. For example, you might record a 1 or 2 if you are very sleepy, but if very refreshed, you would record an 8 or 9.

## RECORD BEFORE SLEEPING

	1	2	3
	0 = very tired 10 = wide awake	0 = physically worn out 10 = relaxed	0 = very tense 10 = calm
MONDAY			
TUESDAY			
WEDNESDAY			
THURSDAY			
FRIDAY			
SATURDAY			
SUNDAY			

# RECORD AFTER ARISING

	A	B	C	D	E
	Hours of sleep last night	0 = awoke very sleepy 10 = very refreshed	0 = fuzzy headed 10 = alert	0 = sleep was restless 10 = tranquil	0 = very disrupted 10 = sleep was better than usual
MONDAY					
TUESDAY					
WEDNESDAY					
THURSDAY					
FRIDAY					
SATURDAY					
SUNDAY					

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